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ABSTRACT

Howard Gardner's multiple intelligence (MI) theory is an alternative to the unitary concept of general intelligence, but it lacks a practical, reliable, and valid method of assessment. The Hillside Assessment of Perceived Intelligences (HAPI) is an attempt to measure the seven constructs of MI theory with an objective, psychometrically sound instrument. Previous investigations have shown that the HAPI provides a reliable profile, but it has not been clear how much validity this profile holds. This investigation into the concurrent validity of the HAPI with other instruments found the patterns of correlation coefficients to be generally supportive of the HAPI scales. Subjects were 338 undergraduate and graduate students and 45 adults from adult education or community volunteers. However, an examination of the construct validity of the scales using contrasted groups produced mixed results. Appendixes list the core components of MI theory and HAPI scale definitions. Four tables are included. (Contains 20 references.) (Author/SLD)

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THE VALIDATION OF THE HILLSIDE ASSESSMENT OF PERCEIVED INTELLIGENCES(HAPI): A MEASURE OF HOWARD GARDNER'S THEORY OF MULTIPLE INTELLIGENCES

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Abstract

Howard Gardner's multiple intelligence (MI) theory is an alternative to the unitary concept of general intelligence, but it lacks a practical, reliable, and valid method of assessment. The Hillside Assessment of Perceived Intelligences (HAPI) is an attempt to measure the seven constructs of MI theory with an objective, psychometrically sound instrument. Previous investigations have shown that the HAPI provides a reliable profile, but it has not been clear how much validity this profile holds. This investigation into the concurrent validity of the HAPI with other instruments found the patterns of correlation coefficients to be generally supportive of the HAPI scales. However, an examination of the construct validity of the scales using contrasted groups produced mixed results.

Introduction

One of psychology's most eminent and resilient contributions to Western culture has been the assessment of intelligence (Binet, 1916; Spearman, 1927; Wechsler, 1958). Intelligence tests, however, have come under regular criticism as inadequate and flawed measures. Beyond the most recent challenges to their claims for universal objectivity, a fundamental source of criticism is the narrow scope of the intelligence quotient (I.Q.) and its limited ability to give a true picture of human intellectual prowess (Gardner, 1983; Gould, 1981; Sternberg, 1982). Over the years, a number of alternative theories of intelligence have been offered (Guilford, 1967; Sternberg, 1982; Thurstone, 1938) but none have enjoyed wide acceptance or use in education, research, or clinical psychology. The I.Q. owes much of its popularity to its simplistic, intuitive appeal, and its match to prevailing social assumptions and a particularly Westernized perspective on the nature of the human mind (Gould, 1981).

An alternative to the unitary concept of general intelligence was proposed by Howard Gardner in his book, Frames of Mind (1983). Gardner proposes that it is better to conceptualize intelligence as comprised of seven distinct yet complementary constructs: linguistic, logical-mathematical, musical, spatial, kinesthetic, interpersonal, and intrapersonal. These constructs, or intelligences, are defined as abilities that permit an individual to solve a problem or create a product that is valued within one or more cultural settings. In other words, by Gardner's definition of intelligence and intellectual ability is not context free.

Since the publication of Frames of Mind, many educators across the country have reacted enthusiastically to the idea that there are seven distinct forms of intelligence (New York Times, 1988). A multiple intelligence (MI) assessment describes a learner's intellectual propensities across a range of endeavors. MI theory holds the promise that individuals have the potential to be successful and perform with intelligence in non-academic activities (e.g., kinesthetic, musical).

Although MI theory has been welcomed by some educators, wider acceptance and use has been limited by the lack of a practical, reliable, and valid method of assessment. Gardner's (1993) broad definition of intelligence and his complex descriptions of the multiple intelligences (see Appendix A) have made it difficult to create a psychometrically sound method of measurement. Indeed, Gardner challenges the basic assumption that intellectual prowess can be measured via paper-and-pencil, multiple-choice type tests.

The Hillside Assessment of Perceived Intelligences (HAPI) is an attempt to measure Gardner's seven constructs of intelligence with an objective, psychometrically sound instrument. The HAPI is a multiple choice questionnaire that was originally developed as a method of assessing the pre-trauma intellectual strengths and weaknesses of brain injured individuals based on MI theory (Shearer, 1991). The 106 items comprising the HAPI are all placed on a one to five Likert-type scale. With respect to the seven MI constructs, 58 of the items inquire about the level of skill in a particular domain, 37 items are concerned with the frequency of participation in activities associated with each construct, and 11 items ask about interest levels. Since it was developed for use with brain injured patients, the HAPI was designed to be completed by an informant, such as a close friend or family member, but can also be self-administered.

The objective of the HAPI is to assess an individual's developed intellectual, problem-

solving, and productive/creative abilities. This includes both convergent and divergent processes as well as skill for practical problem-solving and originality. This is in contrast to the more traditional approach of I.Q. tests that rank individuals along a single, permanent dimension. In MI theory, traditional I.Q. measures assess the convergent aspects of linguistic and logical-mathematical intelligences. Conversely, a MI assessment can provide a broader understanding of a person's strengths, weaknesses, and active involvement in his or her daily life. Thus, in addition to its clinical applications, the HAPI may have potential for use in educational assessment and career planning.

The HAPI has undergone four phases of research and development since it conception in 1986. Phase 1 was concerned with the initial development of the instrument (Way and Shearer, 1990). First, a team of psychologists constructed an initial pool of 111 items based on MI theory. These items were administering to a non-clinical sample of 349 volunteers who were asked to rate "someone you know well such as a close friend or family member." A principal components analysis resulted in an eight factor solution. These components were then were rotated and allowed to correlated moderately (between .10 and .43). The first seven were interpreted as Gardner's theoretical intelligences with the eighth factor tentatively identified as a leadership measure. Internal consistencies for each scale, as measured by coefficient alpha, ranged from .80 to .93.

In Phase 2, the items comprising the HAPI underwent further refinement and field testing. As calculated by Grammatik IV (Wampler, 1989) the original HAPI items had a readability at the 11.4 grade level. Items were then field tested on hospital patients who had less than a high school education and reviewed by a speech pathologist. Following revisions, the readability index for the HAPI dropped to a sixth grade reading level. The HAPI was also reviewed by Howard Gardner and a cultural anthropologist who makes use of MI theory to improve the quality of life for residents of nursing homes (Robinson, 1990). The focus of their review was to evaluate how well the HAPI items and scales fit MI theory. In addition, two female psychologists reviewed item content for possible gender bias. As a result, many items were revised or dropped, and 24 new items were added to fill identified gaps.

The focus of Phase 3 was a multi-informant study of the instrument's reliability and construct validity. The HAPI was self-completed by 67 normal and brain damaged subjects from eight research sites. Each subject then selected a primary and secondary informant to assess him or her using the HAPI. Inter-judge agreements on item ratings were generally between 75% and 85%. Eight items, which had agreement rates below 70%, were revised or replaced by new items for later versions of the HAPI. Using a multi-trait/multi-method approach for the scores on the seven scales, higher correlation coefficients were generally observed between same trait scores measured by different raters (self versus informant) than those observed among different traits measured by the same method (self or informant rated only). The correlations between self and informant ratings on the seven scales ranged from .54 to .80. Also, the internal consistency of each scale, as measured by coefficient alpha, ranged from .75 to .89. Based on 32 participants who completed the HAPI again two months later, the test-retest reliability coefficients ranged from .69 to .86 with an average coefficient of .81.

Phase 4 is the focus of this paper. The first three phases indicated that the HAPI could provide a relatively consistent MI profile based on the perceptions of the informant. It was not known, however, if these perceptions were objective measurements of the actual levels of the

seven theoretical intelligences. To assess the potential validity of the HAPI, two approaches were used: 1) correlations with concurrently administered tests and 2) comparison of contrasted groups. If the seven scales of the HAPI were indeed measuring what they purported to, each scale should correlate with instruments that theoretically measure the same construct, and groups who represent a high or low level of a particular trait should differ from each other.

Procedures

To assess the reliability and validity of the current version of the HAPI, a sample of 383 participants were recruited. This sample was comprised of 338 undergraduate and graduate level college students, and 45 individuals who were either enrolled in adult education courses, clinical patients, or volunteers solicited from the local community. For assessing concurrent validity, 56 of the participants were administered a battery of individual and group tests in addition to the HAPI. These tests were the Strong Interest Inventory, Personal Outlook Questionnaire (POQ), Self Directed Search, Shipley Institute of Living Scale Abstraction and Vocabulary subtests, J.P. Guilford's test of Expressional Fluency, the Spatial Relations subtest from the Career Ability and Placement Survey (CAPS), the Math subtest from the Wide Range Achievement Test (WRAT), J.P. Guilford's Social Translations subtest, and the Assembly subtest from the Purdue Pegboard. Estimates of the subjects' full scale I.Q. scores were made by combining the Shipley Vocabulary and Abstraction scores. This combined score has been found to correlate with the Wechsler Adult Intelligence Scale full scale I.Q. ($r=.79$; Zachary, 1991).

The second approach used was to compare the HAPI scale scores for subjects in identifiable groups that theoretically should differ from another group on their HAPI scale scores. For example, college students who are enrolled in a music theory course would be expected to have higher scores on their HAPI Musical scale than non-music majors. The groups were comprised of college students enrolled in various introductory and upper level courses.

Results

In examining the patterns of correlations between the HAPI scales and the test battery, tests and HAPI scales that purported to measure similar constructs tended to have higher correlations with each other than with tests and HAPI scales that measured other constructs. For example, the Shipley Vocabulary test correlated higher with the HAPI Linguistic scale ($r=.56$) than the other scales (correlations ranging from $r=.11$ for Kinesthetic to $r=.47$ for Intrapersonal). Unfortunately, there were some problematic correlations, such as a higher ($r=.59$) correlation between the Expressional Fluency and HAPI Spatial-Perceptual scale than with the HAPI Linguistic scale ($r=.48$). The estimated full scale I.Q. correlated moderately with many of the HAPI scales and only slightly with some (Intrapersonal, .56; Linguistic, .54; Logical-Mathematical, .50; Spatial-Perceptual, .41; Interpersonal, .38; Musical, .25; and Kinesthetic, .23). The correlations of the HAPI scales with the test batteries can be seen in Tables 1 through 3.

Table 1

Relationship of HAPI Scales with Strong Interest Inventory Occupational Themes

Strong Interest Inventory Occupational Themes	HAPI Scales						
	Musical	Kinesthetic	Logical-Mathematical	Spatial-Perceptual	Linguistic	Interpersonal	Intrapersonal
Realistic	-.03	.24	.25	.40	-.01	.04	.22
Investigative	.24	.27	.41	.48	.34	.28	.43
Artistic	.50	.15	.11	.21	.44	.19	.20
Social	.09	.43	.14	.20	.45	.54	.39
Enterprising	.07	.28	.13	.13	.13	.29	.19
Conventional	-.08	.13	.16	.01	.13	.25	.32

n = 56

Table 2

Relationship of HAPI Scales with Self-Directed Search Scales

Self-Directed Search	HAPI Scales						
	Musical	Kinesthetic	Logical-Mathematical	Spatial-Perceptual	Linguistic	Interpersonal	Intrapersonal
Mechanical	-.04	.18	.16	.31	-.06	-.01	.11
Scientific	.15	.16	.44	.43	.24	.19	.32
Artistic	.22	.19	.16	.36	.30	.17	.21
Teaching	.12	.40	.23	.36	.58	.69	.50
Sales	.26	.28	.01	-.04	.31	.40	.19
Clerical	-.01	.10	.09	.02	.21	.29	.31
Manual	.13	.25	.21	.41	.08	.04	.18
Math	.13	.20	.59	.31	.18	.08	.56
Musical	.51	.03	-.07	-.01	.14	.00	-.05
Friendliness	.26	.30	-.02	-.04	.30	.52	.17
Managerial	.14	.31	.21	.28	.57	.52	.44
Office	.12	.14	.14	.05	.25	.30	.35

n = 56

Table 3

Relationship of HAPI Scales with the Shipley, Guilford, WRAT, CAPS, POQ, Purdue, and Estimated Full Scale I.Q. Scores

	HAPI Scales						
	Musical	Kinesthetic	Logical-Mathematical	Spatial-Perceptual	Linguistic	Interpersonal	Intrapersonal
Shipley Verbal	.25	.11	.31	.29	.56	.36	.47
Shipley Abstraction	.24	.27	.51	.45	.48	.41	.56
Expressional Fluency	.35	.31	.49	.59	.48	.41	.53
Social Translations	.13	.09	.17	.32	.43	.20	.25
WRAT Math	.19	.26	.55	.30	.41	.40	.59
CAPS Spatial Relations	.22	.17	.49	.42	.40	.06	.47
POQ	.10	.28	-.03	.06	.15	.31	.30
Purdue Assembly Test	.22	.22	.19	.29	.28	.23	.23
Estimated Full-Scale IQ	.25	.23	.50	.41	.54	.38	.56

n = 56

In contrasting the HAPI profiles of the groups that would be expected to vary on some scales but not others, the results were mixed. Students in an advanced math course did have a higher mean score on the Logical-Mathematical scale than students in remedial math, and music majors had a higher mean score on the Musical scale than nonmusic majors taking a music course. On the other hand, the mean linguistic score for students in a creative english course was not significantly higher than the mean score for students enrolled in developmental english, nor did the mean Spatial-Perceptual score for students enrolled in an advanced interior design course differ from the mean score for students in beginning interior design. In looking at the five pairs of groups as a set, however, it should be noted that music majors had the highest mean Musical scale score, dance majors were highest on the Kinesthetic scale, students taking advanced math were highest on the Logical-Mathematical scale, and students in interior design were highest on the Spatial-Perceptual scale. A summary of these results can be found in Table 4.

The internal consistencies of the seven scales as measured by Cronbach's alpha were found to be the following: Musical, .84; Kinesthetic, .77; Logical-Mathematical, .85; Spatial-Perceptual, .85; Linguistic, .87; Interpersonal, .84; and Intrapersonal, .82. These coefficients are similar to those found in earlier stages of the HAPI's development.

Table 4

Comparison of Contrasted Groups on the HAPI Scales

Groups with n in parentheses	HAPI Scale Means						
	Musical	Kinesthetic	Logical-Mathematical	Spatial-Perceptual	Linguistic	Interpersonal	Intrapersonal
Dance Majors (7)	65	65	**54**	51	66	65	58
Beginners (19)	56	58	**41**	45	56	55	49
Advanced Math (14)	**35**	42	**65**	54	59	54	**65**
Remedial Math (21)	**50**	44	**36**	41	51	60	**46**
Music Majors (13)	**72**	46	49	48	54	59	53
Nonmusic Majors (14)	**42**	47	44	53	56	62	54
Creative English (20)	53	48	47	48	66	61	50
Developmental English (8)	57	58	50	52	60	65	56
Beginning Interior Design (24)	**53**	49	56	67	59	62	60
Advanced Interior Design (10)	**40**	52	48	62	60	62	55

Means in bold were significantly different on independent t-tests ($p < .05$)

Discussion

Although the correlational data was supportive of the concurrent validity of the HAPI scales, the examination of contrasted groups produced mixed support for the validity of the HAPI profile. For the correlational portion of the study, the pattern of correlations were

generally supportive of the HAPI. Considering the number of correlations involved, the likelihood is high that some of the correlations were spurious. This means the overall pattern of correlation, rather than individual coefficients examined in isolation, is of most interest. From this global perspective, the correlation coefficients were generally higher between a HAPI scale and test that measured like traits as compared to those measuring dissimilar ones. The scales of the HAPI can be characterized as showing evidence of concurrent validity with tests that purport to measure similar constructs.

The contrasted groups examination, however, proved more problematic. Although some groups showed expected profile differences, just as many did not. In looking at the groups as a set, rather than just making pairwise comparisons, groups that would be expected to have the highest mean scale scores did so for the Musical, Kinesthetic, Logical-Mathematical, and Spatial-Perceptual scales. The profile for the creative english course was as predicted: the highest scale score was for the Linguistic scale. Some of the other profiles, such as the relatively high Linguistic score for students in developmental english, however, were not expected. One contributing factor to the mixed results of the contrasted groups may have been the small sample sizes. Parameter estimates for small samples can be quite volative. It may also not be accurate to portray the members of a group as representing a high or low level of a trait based solely on enrollment in a course. Perhaps the use of objective criterions would result in reduced within-group variability as well as more accurate groupings on the constructs.

The HAPI was developed with the goal of creating a practical method of obtaining a "reasonable estimate" of an individual's skill and ability in seven areas specified by the theory of multiple intelligences. Gardner's unique definition of intelligence presents a challenge to standard methods of testing. In a real sense, the creative, productive, and contextual nature of the multiple intelligences renders them practically untestable using standard objective measurement. Gould (1981) has presented arguments against the "reification" of intelligence and the fallacy of truly objective and culture-free tests. An individual's intellectual capacities and potentials may indeed be mysteries rather than "immoveable objects." On the other hand, careful observation, discerning inquiry, and familiarity can reveal important insights regarding skills, abilities, and proclivities. Such a process can serve as a method of triangulation during navigation through life where the person, his/her history, and environmental supports can be marshalled to maximize intellectual success and personal satisfaction.

The results of these four phases of research indicate that the HAPI may not be as psychometrically precise an objective measurement that the I.Q. purports to be, but accumulated evidence supports its validity as a tool to gather useful and meaningful data regarding an individual's profile in seven areas of everyday intellectual functioning. A HAPI profile may not be taken as objective truth, but rather as descriptive hypotheses from the informant's perspective. This descriptive profile then can be incorporated into the counseling process as a useful means of discussion and discovery. Truth about the person does not come from a single score, but rather it is discovered through collaboration in a fact-finding and person-centered process.

References

Binet, A. & Simon, T. (1916). The development of intelligence in children. Baltimore: Williams & Wilkens.

Christenson, P. R. & Guilford, J. P. (1958). Expressional fluency. Beverly Hills: Sheridan Supply.

Gardner, H. (1983). Frames of mind: A theory of multiple intelligences. New York: Basic Books.

Gould, S. J. (1981). The mismeasure of man. New York: WW Norton.

Guilford, J. P. (1967). The nature of human intelligence. New York: McGraw Hill.

Hansen, J. C. (1992). User's guide for the Strong Interest Inventory. Palo Alto, CA: Consulting Psychologists Press.

Jastak & Jastak. (1984). The Wide Range Achievement Test-Revised. Wilmington, DE: Jastak Associates, Inc.

Knapp, L. & Knapp, R. R. (1981). Career Ability Placement Scale. San Diego, CA: EdITS.

New York Times. (May 22, 1988). "In Indiana, public schools make frills standard".

O'Sullivan, M. & Guilford, J. P. (1976). Four factor tests of social intelligence (behavioral cognition) manual of instructions and interpretations. Orange, CA: Sheridan Psychological Services.

Robinson, E. (1990). Care giver's annual. Salem, Oregon: Ellen Robinson.

Shearer, B. (1991). An investigation into the validity, reliability and clinical utility of the Hillside Assessment of Perceived Intelligences. (Doctoral dissertation, Union Institute, Cincinnati, OH). Dissertation Abstracts International, 52, 6647B.

Shipley, W. C. (1940). A self-administering scale for measuring intellectual impairment and deterioration. Journal of Psychology, 9, 371-377.

Spearman, C. (1927). The abilities of man. New York: MacMillan.

Sternberg, R. J. (1982). Handbook of human intelligence. Cambridge, England: Cambridge University Press.

Thurstone, L. L. (1938). Primary mental abilities. Chicago: University of Chicago Press.

Wampler, B. E. (1989). Grammatik IV. San Francisco: Reference Software International.

Way, D., & Shearer, B. (October, 1990). Phase 1: Development of the Hillside Assessment of Pre-trauma Intelligences. Paper presented at the annual meeting of Midwest Educational Research Association, Chicago, IL.

Wechsler, D. (1958). The measurement and appraisal of adult intelligence. Baltimore: Williams & Wilkens.

Zachary, R. (1991). Shipley Institute of Living Scale Revised manual. Los Angeles, CA: Western Psychological Services.

Inquiries concerning the HAPI should be addressed to C. Branton Shearer, 519 S. DePeyster St., Kent, Ohio 44240. The HAPI project was awarded a twelve month Innovation Grant from the National Institute of Disability Rehabilitation Research of the U.S. Department of Education to develop cognitive rehabilitation strategies based on a multiple intelligence assessment.

Appendix A

Core Components of the Multiple Intelligences
as Described by Howard Gardner

Musical

". . . sensitivity to pitch, melody, rhythm, timbre, and the emotional aspects of sounds. . . ."

Functional Aspects:

1) Vocal ability
2) Instrumental skill
3) Musical composition and appreciation

Kinesthetic

". . . the ability to use one's body in highly differentiated and skilled ways, for expressive as well as goal-directed purposes . . . to work skillfully with objects, both those that involve fine motor movements of one's fingers and hands and those that exploit gross motor movements of the body . . . ."

Functional Aspects:

1) A family of procedures for translating intention into action
2) Learning and remembering complex motor sequences and patterns of behavior
3) The sense of coordination and rhythm that leads to well-executed and powerful motions.

Logical-Mathematical

". . . to appreciate the actions that one can perform upon objects, the relations that obtain among those actions, the statements (or propositions) that one can make about actual potential actions, and the relationships among those statements."

Functional Aspects:

1) Verbal logical reasoning
2) Mathematical reasoning

Spatial-Perceptual

". . . to perceive the visual world accurately, to perform transformations and modifications upon one's initial perceptions, and to be able to re-create aspects of one's visual experience, even in the absence of relevant physical stimuli. . . ."

Functional Aspects:

1) To recognize instances of the same element

2) To transform or recognize a transformation of one element into another
3) Capacity to conjure up mental imagery and then transform it
4) To produce a graphic likeness of spatial information
5) Sensitivity to composition

Linguistic

". . . sensitivity to the meaning of words, the order among words, sounds, rhythms, inflections, different functions of language, phonology, syntax, semantics, and pragmatics."

Functional Aspects:

1) Rhetorical aspect of language: to convince others of a course of action
2) Mnemonic potential of language: to remember information
3) The role of language in explanation: teaching and learning

Interpersonal

". . . the ability to know other people - to recognize their faces, their voices, and their persons: to react appropriately to them . . . ."

Functional Aspects:

1) To read the signals of other people
2) To understand others' motives, feelings, and intentions
3) To teach, heal, lead, and motivate

Intrapersonal

". . . our sensitivity to our own feelings, our own wants and fears, our own personal histories . . .awareness of our own strengths, weaknesses, plans and goals . . . ."

Functional Aspects:

1) One's sense of self in a culture
2) Ability to use discrimination and labeling to guide behavior

Aspects:

1) School Math
   - did well in studying math at school

2) Everyday Math
   - used math effectively in everyday life

3) Everyday Problem Solving
   - able to use logical reasoning to solve everyday problems

4) Strategy Games
   - games of skill and strategy

5) Science
   - interested and involved in science and scientific-type inquiry
   - collected things and may have studied nature

Spatial-Perceptual

". . . to perceive the visual world accurately, to perform transformations and modifications upon one's initial perceptions, and to be able to re-create aspects of one's visual experience, even in the absence of relevant physical stimuli. . . ."

Aspects:

1) Space Awareness
   - able to solve problems involving spatial orientation and moving objects through space such as driving a car, finding one's way around

2) Working with Objects
   - building, arranging, decorating, or fixing things
   - eye-hand coordination

3) Artistic Design
   - jobs or projects where aesthetic or design are important

Linguistic

". . . sensitivity to the meaning of words, the order among words, sounds, rhythms, inflections, different functions of language, phonology, syntax, semantics, and pragmatics."

Aspects:

Appendix B

HAPI Scale Definitions

Musical

". . . sensitivity to pitch, melody, rhythm, timbre, and the emotional aspects of sounds. . . ."

Aspects:

1) Vocal ability
   - a good voice for singing in tune and in harmony
   - good rhythm sense

2) Instrumental skill
   - played an instrument as a teenager or adult

3) Composing
   - made up songs or poetry and had tunes on her mind

4) Active Listener/Appreciation
   - interest in music such as rock, classical, country, etc.

Kinesthetic

". . . the ability to use one's body in highly differentiated and skilled ways, for expressive as well as goal-directed purposes . . . to work skillfully with objects, both those that involve fine motor movements of one's fingers and hands and those that exploit gross motor movements of the body . . . ."

Aspects:

1) Athletics
   - involvement and skill in sports or other physical activities

2) Physical Dexterity: Working with hands and expressive movement
   - able to use hands skillfully when working with objects
   - uses body for learning, dancing, or acting

Logical-Mathematical

". . . to appreciate the actions that one can perform upon objects, the relations that obtain among those actions, the statements (or propositions) that one can make about actual potential actions, and the relationships among those statements."

1) Expressive Sensitivity
   - paid attention to and used language for communication and expression
   - primarily oral

2) Rhetorical Skill
   - to use language effectively for interpersonal negotiation, persuasion
   - at school, work, home, or among friends
   - oral communication

3) Written-Academic Ability
   - to use words well in writing to create reports, letters, stories
   - verbal memory

Interpersonal

". . . the ability to know other people - to recognize their faces, their voices, and their persons; to react appropriately to them . . . ."

Aspects:

1) Social Sensitivity
   - aware of and concerned about others
   - socially astute

2) Social Persuasion
   - able to influence others

3) Interpersonal Work
   - interest and skill for people-oriented work

Intrapersonal

". . . our sensitivity to our own feelings, our own wants and fears, our own personal histories . . .awareness of our own strengths, weaknesses, plans and goals . . . ."

Aspects:

1) Personal Knowledge / Efficacy
   - aware of own strengths / needs and able to plan effectively to achieve personal goals

2) Self / Other Effectiveness
   - able to use self-knowledge to form satisfying social relationships

3) Calculations and Meta-Cognition

- self-awareness provides understanding of one's own logical reasoning
- meta-cognition: "thinking about thinking"
- reflective reasoning

4) Spatial Problem-Solving
   - self-awareness that allows one to problem-solve while moving self or objects through space
   - awareness of one's own mental imagery